AMERICAN ANNALS OF THE DEAF

FOUNDED 1847

Official Organ

Conference of Executives of American Schools for the Deaf
FOUNDED 1868

Convention of American Instructors of the Deaf
FOUNDED 1850

POWRIE V. DOCTOR
Editor

LEONARD M. ELSTAD
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Under the direction of

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HOWARD M. QUIGLEY, Minnesota, 1954
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MAY

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The Convention of American Instructors of the Deaf, founded in 1850 and incorporated by act of Congress in 1897, is an organization of educators of the deaf in the United States and Canada with the general object of "promotion of the education of the deaf on the broadest, most advanced, and practical lines," and for that purpose "to secure the harmonious union in the organization of all persons actually engaged in educating the deaf in America."

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AMERICAN ANNALS OF THE DEAF

VOL. 97 MAY, 1952 NO. 3

The Educational Preparation of Oral Teachers of the Deaf*

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I. INTRODUCTION

DEAF children are taught orally in public residential schools in forty-four states and in day schools and day classes in twenty-six states. All oral teachers of the deaf teach the same kind of children and teach approximately the same things to these children, regardless of the type of school or the location of the school. In actual practice, the educational preparation of teachers of the deaf, all of whom are doing approximately the same thing, varies considerably.

A survey of the educational preparation of a representative sampling of teachers of the deaf was made and the data analyzed in terms of (1) teachers rated "best" and teachers rated "poorest" in day and residential schools and, (2) comparison of residential and day school teachers. If there appear to be significant differences between the "best" teachers and the "poorest" teachers, or between the teachers in the various types of schools, the implications of these differences should be considered in formulating a training program to prepare oral academic teachers of the deaf.

II. METHOD OF CONDUCTING SURVEY

To obtain data for such an analysis, a questionnaire

*This article is a summary of part of one chapter in the thesis *The Training of Academic Teachers of the Deaf* submitted to the faculty of the School of Education of Rutgers University in partial fulfillment of the requirements for the degree Doctor of Education. The whole thesis is 359 pages and copies are deposited in the Rutgers University library and the Gallaudet College library.

was used. THE AMERICAN ANNALS OF THE DEAF, of January, 1948, lists sixty-six public residential schools for the deaf. Eight of these schools are segregated schools for Negroes only; and as the training of the teachers in these schools is not representative of the training of the teachers in the other schools, these schools were excluded from the survey. Gallaudet College is one of the sixty-six schools listed, but it was excluded because it is of collegiate level. A single class for the deaf in the Sonoma State Home for the Feebleminded in California was also excluded. Questionnaires and letters to the superintendents were sent to the remaining fifty-six public residential schools, and some information was received from forty-six of these schools making a response of eighty-two percent.

There were 115 public day schools for the deaf listed in the January, 1948, AMERICAN ANNALS OF THE DEAF. Of this number, twenty-five were listed as having six or more teachers each. Letters and questionnaires were sent to the heads of these schools. Some information was received from twenty-three of these schools, constituting ninety-two percent of the total. The head of the school was requested to give the questionnaires to the three "best" teachers in the school and to the three "poorest" teachers in the school. This is the reason the schools having six or more teachers were the ones selected.

To aid the head of the school in selecting these teachers, criteria were suggested in the form of seven questions as follows:

1. Is the teacher interested in trying to learn all he can about each child in his class? 2. Is the teacher more interested in teaching children than subject matter? 3. Is the teacher able to appraise validly the learning in his class? 4. Does the teacher have the ability to stimulate the children's interest and curiosity? 5. Is the teacher able to provide a variety of learning experiences? 6. Is the teacher able to use his own knowledge, i.e., integrate other fields with the particular lesson he is teaching? 7. Is the teacher competent in the phases of the work requiring technical knowledge?

The first six of these criteria were proposed by S. M.

Corsey,[1] and the seventh was added by this investigator because of the importance of technical knowledge in this special field.

Six questionnaires were enclosed in the letter to each school head and were entitled "Questionnaire to Oral Teachers of the Deaf." These questionnaires were identical, with the exception that each had a number on it, varying from one to six. The school head was asked to give three of the questionnaires with certain numbers to his three poorest teachers, and the others to his three best teachers. The questionnaires specifically stated that the name of the teacher was not to be placed on the questionnaire.

The head of each school was also asked to indicate how many of his oral teachers, i.e., those teachers who teach speech and teach by speech, fell into each of the following categories:

a. Education of at least a baccalaureate level plus formal training for teaching the deaf.
b. Education below a baccalaureate level plus formal training for teaching the deaf.
c. Education of at least a baccalaureate level with only specialized training while in service.
d. Education below a baccalaureate level with only specialized training while in service.

III. Analysis of Data

The determination of the significance of the differences between groups in analyzing the data in this study was calculated by means of the Chi-square.[2, 3]

Table I shows how the heads of the public residential schools and the public day schools classified the teachers on their staffs according to educational preparation and training. Using the Chi-square test of significance, it was found that the data in this table shows:

1. S. M. Corey, "Evaluating Technical Teaching Competence," *Elementary School Journal*, 41:577-86, April, 1941.
2. A. L. Edwards, *Statistical Analysis*, (New York: Rinehart, 1946), p. 342.
3. *Ibid.*, p. 25 (For example of method used to determine expected frequencies).

a. The percentage of the teachers in day schools who had formal training to teach the deaf is significantly greater than the percentage of teachers in residential schools who had formal training to teach the deaf. This was significant at the one percent level.
b. The percentage of teachers in the day schools who have at least a baccalaureate degree is greater than the percentage of teachers in residential schools who have at least a baccalaureate degree. This was significant at the one percent level.

The data obtained from the questionnaires were analyzed and the findings are here presented following the statement of each question as it appeared on the questionnaire. Questionnaires analyzed involved 118 "best" residential school teachers, 118 "poorest" residential school teachers, 67 "best" day school teachers, and 56 "poorest" day school teachers.

TABLE I

DISTRIBUTION OF TEACHERS ACCORDING TO (a) TYPE OF SCHOOLS, AND (b) EXTENT OF TRAINING

Types of Schools	Extent of Training				Totals
	a	b	c	d	
I. Residential Schools					
No. teachers	310	309	152	134	905
Percentage	34.2	34.2	16.8	14.8	100
II. Day Schools					
No. teachers	152	47	41	18	258
Percentage	58.9	18.2	15.9	7.0	100
	a & b	c & d	a & c	b & d	
I. Residential Schools					
No. teachers	619	286	462	443	
Percentage	68.4	31.6	51.0	49.0	
II. Day Schools					
No. teachers	199	59	193	65	
Percentage	77.1	22.9	74.8	25.2	

NOTES:

a. Education of at least a baccalaureate level plus formal training for teaching the deaf.
b. Education below a baccalaureate level plus formal training for teaching the deaf.
c. Education of at least a baccalaureate level with only specialized training while in-service.
d. Education below a baccalaureate level with only specialized training while in-service.

1. *What college degree do you hold?*

a. More of the "best" residential school teachers hold

degrees than the "poorest" residential school teachers. This difference was significant at the one percent level.

b. The difference between the "best" and "poorest" day school teachers is not quite significant at the five percent level.

c. The total group of day school teachers has a greater proportion of degree teachers than the total group of residential school teachers. The difference is significant at the one percent level.

d. The "poorest" day school teachers group have a greater proportion of degree teachers than the "poorest" residential school teachers The difference is significant at the one percent level.

e. The total number of "best" teachers holding degrees from both types of schools combined is greater than the total number of "poorest" teachers holding degrees. The difference is significant at the one percent level.

These findings indicate that the day school teachers have a higher level of educational background as a group, and they appear to be a more homogeneous group in this respect than the residential school teachers. Among the residential school teachers, where this homogeneity is not present, the fact that the number of "best" teachers having degrees was highly significant plus the finding that the total number of "best" teachers holding degrees was highly significant is an indication that recommendations for the preparation of teachers of the deaf should include the requirement of at least four years of college education.

1a. *When was the degree received?*

a. A large majority of teachers selected who hold degrees received them since 1928.

b. Of the teachers who received degrees before 1928, more were selected as "best" teachers than were selected as "poorest" teachers.

It would be expected that the number of teachers receiving degrees before 1928 would constitute a minority of the profession, as they probably would have been teach-

ing more than twenty years. Finding *b* is some added evidence confirming the value of a college education for the teacher of the deaf.

2. ***How many years have you taught the deaf, not including current year?***

a. There is a very slight tendency to pick more teachers with less than five years of experience as the "poorest" teachers.

b. In general the number of years of experience does not have any apparent relationship to the classification of the teacher.

c. There are teachers selected as the "best" teachers in their school during their first year of teaching, and other teachers selected as the "poorest" teachers in their school during their first year of teaching.

d. There are teachers with more than thirty years of experience who were selected as the "best" teachers, and other teachers with a like number of years of experience selected as the "poorest" teachers in their school.

3. ***How many years, if any, have you taught hearing children?***

a. A larger number of "poorest" residential school teachers have taught the hearing than "best" residential school teachers. The difference is significant at the five percent level.

b. A larger percentage of "poorest" day school teachers have taught the hearing than "best" day school teachers. However, the difference is not significant.

c. A larger total number of "poorest" teachers from both types of schools have taught the hearing than "best" teachers from these schools. The difference is not quite significant at five percent level.

d. No significant differences were found when the residential school teachers were compared with the day school teachers in the categories of "best" teachers, "poorest" teachers, and total number of teachers in each type of school.

There seem to be two possible explanations for this find-

ing that the teachers with experience in teaching the hearing tend to be selected as the "poorest" teachers of the deaf. The first of these is that public school teachers were pressed into service in schools for the deaf when the schools were unable to get trained teachers of the deaf; and as the training of these teachers was brief and of an in-service nature, they did not get enough training to become good teachers of the deaf.

To determine whether this was the actual explanation, the training of the teachers who had experience teaching hearing children was analyzed in terms of whether it was pre-service or in-service. The information was obtained from the answers to question ten on the questionnaire and following are the findings:

a. The difference in the type of training of the "best" and "poorest" teachers in the residential schools is not quite statistically significant at the five percent level.
b. The difference of the type of training of the total of the "best" teachers in comparison with the total of the "poorest" teachers is not statistically significant.
c. The difference in the training of the "best" and "poorest" day school teachers is not statistically significant.

It appears from the data presented that the type of training of the teacher with hearing school experience may be important in respect to the residential school teacher, but not conclusive. There is a strong tendency for the residential school teacher who has had pre-service training and also had experience teaching the hearing to be selected as a better teacher, while the residential school teacher who has had experience teaching the hearing and then only in-service training, to be selected as a poorer teacher. However, this is only a strong tendency and not true in enough cases to be considered the only explanation of the differences.

The second possible explanation is that teachers who were not very successful at public school work decided to try another field and as a group did not tend to be success-

ful in their new venture.

An analysis of the number of years the teachers taught hearing children shows:

a. More than half of those teachers who taught hearing children did so five years or less.
b. The teachers who have had a greater number of years of experience teaching hearing children tend to be selected as the "poorest" teachers in their schools.

The data presented here, concerned with experience teaching hearing children, are not clear-cut enough to draw any positive conclusions. They indicate a tendency contrary to the opinion of many people that teachers of the deaf should have experience teaching hearing children. Since this question is so vital, it warrants another special research study.

4. *How many college courses have you completed since you began to teach the deaf, other than courses in the education of the deaf?*

The amount of formal study carried on by the teacher after he has begun his formal teaching career is generally regarded as an indication of his professional interest. Many school systems require that teachers take courses to enable them to advance on the salary scale. This question was worded to exclude courses in education of the deaf as there have been almost no courses of this type offered for in-service teachers of the deaf that are not a repetition of the courses taken during original training.

Using the Chi-square test of significance of the differences between the number who had taken no courses and the number who had taken one or more courses it was found that:

a. There are no significant differences between the "best" teachers and the "poorest" teachers when the types of schools are combined, nor in either type of school.
b. There are no significant differences between the residential school teachers and the day school teachers.
c. It was determined by inspection that the "best" teachers who took courses tended to take a larger

number of courses than the "poorest" teachers who took courses, but this is only a slight trend and does not appear to be significant.

This evidence indicates that college work taken in areas other than education of the deaf, after the teacher has started to teach the deaf, does not differentiate between the good and the poor teacher.

5. ***Do you hold a certificate from the "Conference of Executives of American Schools for the Deaf?" Is it Class A, B, or C?***

a. Of the 236 residential school teachers 120 were certified by the Conference.
b. The larger number of "best" residential school teachers certified, in contrast to the "poorest" residential school teachers certified, was significant at the five percent level.
c. Very few day school teachers were certified by the Conference of Executives.

The small number of day school teachers certified by the Conference is not surprising as this type of certification is not required of any day school teachers by their employing bodies.

6. ***Do you hold a special credential to teach the deaf from your state department of education?***

a. There is no significant difference between the "best" and the "poorest" teachers in either type of school on the basis of state certification.

No significant differences should be expected as schools ordinarily would require certification of all teachers regardless of whether they were good or poor. The significant difference found among residential school teachers in being certified by the Conference, in contrast to this expectation, may be explained by the fact that more of the better teachers in those schools desire to be certified by their professional body even when teaching in schools where such certification is not required.

Only 18 percent of the teachers in the sample from the residential schools are certified by their state departments

of education, while 63 percent of the day school teachers are certified by their state departments. These facts are evidence that many of the public residential schools are semi-autonomous units as far as the educational system of the state is concerned. There are ten states that require no special certification for day school teachers.[4]

A tabulation was made of the number of residential school teachers that were not certified by any group. It was found that 46 percent of the "poorest" teachers were not certified by any group, while only 28 percent of the "best" residential school teachers were not certified by any group. This difference is significant at the one percent level. This, of course, does not mean that certification makes the teachers better; but it indicates that the better residential school teachers tend to take steps to become certified by one body or another.

7. *Do you hold a special credential to teach the deaf from your city board of education?*

a. Six cities grant special certificates to the teachers of the deaf. These cities are Boston, Chicago, Minneapolis, Newark, New York, and Philadelphia.

b. There were forty-six day school teachers, constituting 37 per cent of the sample, from these cities who participated in this study.

8. *Did you have pre-service training to teach the deaf in a formal training class in a school for the deaf? a. Did you receive college credit for this pre-service training?* (1) *Undergraduate credit* (2) *Graduate credit? b. Did you teach a regular deaf class, other than supervised practice teaching, the year you took your training?*

The question about teaching a regular class of deaf children the year training was taken was included to check on the validity of the answers. It is highly likely that those who reported teaching at the same time training was taken had a form of in-service training rather than pre-service training.

4. R. G. Brill, The Training of Academic Teachers of the Deaf, (unpublished Doctor's thesis, Rutgers University, New Brunswick, N. J., 1950), p. 150.

a. More "best" teachers than "poorest" teachers in residential schools had pre-service training. The difference was significant at thefive percent level.
b. A higher percentage of "poorest" day school teachers than "best" day school teachers had pre-service formal training. The difference was not significant.
c. The difference in the percentages of the total residential school teachers and the total day school teachers having pre-service training was not significant.
d. Forty-two percent of the residential school teachers taking pre-service training took it at institutions granting college credit for the work.
e. Sixty-six percent of the day school teachers taking pre-service training took it at institutions granting college credit for the work.
f. Of the residential school teachers who did receive college credit, a consistently larger proportion received graduate credit in contrast to the day school teachers who received college credit for their training. This was significant at nearly the one percent level.

In spite of the close agreement in percentages of the residential and day school teachers in pre-service training, there is some evidence that it may have differed in kind. Supporting this possibility is the finding that pre-service training distinguishes between the "best" and "poorest" residential school teachers while it does not distinguish between "best" and "poorest" day school teachers. The difference in the type of institutions where the training was taken is indicated by the difference in the percentages receiving college credit for the work. While the possibility of difference is indicated, there is no evidence to indicate that one is better than the other.

9. *Did you take in-service training in place of full-time pre-service formal training? Did you receive college credit for this in-service training* (1) *Undergraduate credit?* (2) *Graduate credit?*

Although question eight and question nine seem to be mutually exclusive, in actual responses a number of teach-

ers indicated they had both pre-service formal training and an in-service training program the first year they taught. A number of teachers did not indicate any training.

a. From the residential school group 29 percent indicated they had received in-service training, and from the day school group 23 percent indicated they had received in-service training.
b. More "poorest" residential school teachers received in-service training than "best" residential school teachers. The difference between the two groups was significant at the one percent level.
c. More "poorest" teachers than "best" teachers from both types of schools received in-service training. The difference between the two groups was significant at the one percent level.
d. The difference between the "best" and "poorest" teachers in the day schools was not significant.

These data support the conclusion that, particularly as far as residential school teachers are concerned, pre-service formal training seems to be more valuable in preparing better teachers than in-service training.

A possible explanation of why the "poorest" and "best" day school teachers did not differ significantly in terms of whether they had pre-service or in-service training may be that there is not so great a difference between the two kinds of training as far as day school teachers are concerned. Of twenty-eight day school teachers who took in-service training, twelve, which is 43 percent received college credit for the work; and eleven, which is 18 percent of the seventy residential school teachers taking in-service training, received such credits.

A commission of the Conference of Executives of American Schools for the Deaf has shown that there were nineteen collegiate institutions offering limited courses in the education of the deaf, with inadequate opportunities for practicum with deaf children.[5] It is possible that a larger number of day school teachers received their pre-service

5. *Ibid.*, p. 124.

training in these institutions than did residential school teachers and that this type of training is more nearly similar to in-service training of the type where the teacher takes some courses in the area while teaching.

The answers to this question also showed that six percent of the residential school teachers have had no training, while eleven percent of the day school teachers have had no training in this special field.

10. *The questionnaire listed twenty-one courses that are taught in various training programs for teachers of the deaf.*

The list was assembled by noting the courses offered in the Clarke School training class, the Gallaudet College training class, the Central Institute for the Deaf training class, and the Western Pennsylvania School for the Deaf training class. The following instructions were given with the question:

(1) In Column A write the academic year (Example: 1943-'44) opposite the courses you took during pre-service formal training.

(2) In Column B write the year opposite the courses you took as part of your original training, but taken as in-service courses.

(3) In Column C write the year opposite any courses you have taken since your original training was completed.

(4) At the bottom add any other courses in the education of the deaf you may have had that are not listed, indicating the year taken.

The following findings are based on the data gathered in answer to this question. In using the Chi-square test of significance the pre-service training groups were those listed in A plus A & C, while the in-service training groups were those in B plus B & C.

a. The total number of "best" teachers in the two types of schools took more courses as pre-service training. The 'poorest' teachers took more courses as in-serv-

ice training. The difference was significant at the five percent level.

b. The "best" teachers in the residential schools took more courses as pre-service training. The "poorest" teachers took more courses as in-service training. The difference was significant at the five percent level.

c. The differences between the "best" and the "poorest" day school teachers, and the totals of the residential and day school teachers were not significant.

The findings from the data obtained from question ten substantiate the findings from question eight and question nine that a larger number of the total "best" teachers of the whole group, and a larger number of the "best" residential school teachers had pre-service training.

IV. Summary of Conclusions

This study has interpreted data obtained from a survey of public residential schools for the deaf and public day schools for the deaf. These findings can be summarized:

1. The "best" teachers are distinguished from the "poorest' teachers in the following ways:

a. The "best" teachers are more likely to hold a college degree.

b. The "best" teachers are more likely to have received their training to teach the deaf in a formal, pre-service training center, not by in-service training.

c. The "best" teachers in the residential schools are more likely to hold credentials from some certificating body, even though the school does not require it.

2. The "best" teachers cannot be distinguished from the "poorest' teachers in the following ways:

a. The number of years of experience teaching the deaf has no apparent relationship to the rating of a teacher.

b. College study in fields other than education of the deaf since beginning to teach has no apparent relationship to the rating of a teacher.

c. Experience teaching hearing children does not clearly distinguish between "best" and "poorest" teachers.

There is a tendency, particularly among the residential school teachers, for this experience to be associated with the "poorest" teachers.

3. The day school teachers are distinguished from the residential school teachers in the following ways:

a. The day school teachers are more likely to be college graduates than the residential school teachers.

b. The day school teachers are more likely to have had formal, pre-service training and less likely to have had in-service training than the residential school teachers.

c. The day school teachers are more likely to have taken their training at institutions which offered college credit for this work.

d. The day school teacher is more likely to have received undergraduate credit, and the residential school teacher is more likely to have received graduate credit when college credit was granted for training.

e. The day school teacher is more likely to hold a special credential issued by the state department of education. The residential school teacher is more likely to hold a credential issued by the Conference of Executives of American Schools for the Deaf.

We have come a long way from the medicine show with its extravagant claims of what was good for man and beast. It has been a long and difficult process to teach the American people the importance of the individually studied and diagnosed disease, the necessity for the individually prescribed therapy. Diseases may look alike to the uninitiated, but the doctor knows how different they are. And how differently they must be treated.

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Counselling the Parents of Acoustically Handicapped Children*

LeRoy D. Hedgecock, Ph.D.

Section of Otolaryngology and Rhinology
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WHILE the subject of this discussion does not allow me to contribute nor even to review a vast body of new knowledge, it does permit a report of significant strides in the application of our knowledge. In recent years there has been a growing interest in the problems of deafness with particular attention to the preventive, corrective and rehabilitative measures that apply to these problems.

It does not require an exhaustive survey of facilities to reveal that an increasing number of agencies and individuals are providing improved equipment and procedures for dealing with the hearing problems of children. A questionnaire distributed in 1950 to accredited medical schools in the United States and Canada showed that 27 individuals in fifteen institutions were serving in capacity of nonmedical consultants or teachers in speech and hearing therapy. Several medical centers have speech and hearing clinics and some conduct classes for the deaf and hard of hearing. A number of schools questioned offer lectures on speech and hearing problems and provide observation in this field for medical students.

Audiologic services under sponsorship of educational institutions and state departments of education as well as public health and private agencies have undergone extensive growth since the end of World War II. Outstanding in this development have been college and university speech and hearing clinics which serve most of the larger communities and many smaller communities throughout the United States. Also of note are the preschool and extra-

* Read at the meeting of the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology, Chicago, Illinois, October 14, 1951

curricular programs in speech and hearing therapy offered by numerous local chapters of the American Hearing Society. During the year 1950-1951 in eighteen states, departments of health were carrying on programs in conservation of hearing and in thirty-one states, departments of education were conducting some type of program in speech and hearing rehabilitation. The National Society for Crippled Children and Adults, Inc. had facilities for speech and hearing therapy in eighteen states during 1950-1951. I have no data on the activities in this field of the public, parochial and private schools, but it is apparent from the demand for teachers trained in speech and hearing therapy that such work is being expanded in the school systems throughout the country.

While it cannot be said that all of these facilities and services are standardized, it is true that reliable information on suitable equipment and procedures is readily available to all. A recent textbook on public school audiometry by Dahl should do much to bring about more uniform and more reliable audiometric procedures. A book by Watson and Tolan on hearing tests and hearing instruments describes in considerable detail most of the equipment and technics used for clinical evaluation and diagnosis of hearing disorders. A manual for planning a clinic for the rehabilitation of the acoustically handicapped by Bergman deals suitably with the development, the function and the organization of audiology clinics. The combined bibliographies of these books provide a comprehensive listing of the recent research and writing on the subject of hearing tests.

In 1949 Utley prepared a concise review of tests and procedures for determining auditory acuity of young children. The procedures described include the use of percussion toys, squeaking toys, whistles, horns, bells, pitch pipes and meaningful sounds, such as tapping the feeding bottle, clapping the hands, whistling and vocalizing. A variety of situations are described in which observations of a child's responses may provide reliable clues to the acuity of hearing. "The Peep Show" technic is reviewed. Testing of speech reception is discussed and encouraged whenever

the vocabulary and language development of the child permit. Utley also reports on several of the early attempts at objective audiometry by the use of the electro-encephalograph and the skin galvanometer. During the last two years the galvanic skin resistance technic in audiometry as described by Bordley and Hardy has undergone considerable trial and validation. The results have proved to be reasonably reliable in determining the functional condition of the auditory mechanism without dependence on intentional response of the individual being tested.

Briefly this technic utilizes a conditioned response obtained by associating sound stimuli with electric shock. After conditioning is established, the sound alone, if it is heard, will produce a sweat response which is normally elicited by electric shock. This response can be measured precisely by the resistance of the skin to a minute electric current. In this way it is possible to determine the lowest levels at which sounds can be heard and thus to plot an audiogram.

Despite certain limitations and difficulties of administering the above test, I believe it is correct to say that this procedure in the hands of experienced examiners has passed the experimental stage. It is being used clinically now at a number of audiologic centers.

With the information obtained by one or several of the audiometric technics added to that obtained by a thorough case history and otologic examination, it frequently is possible to answer the question of what caused the loss of hearing. With still greater certainty it becomes possible to determine what can be done in the way of treatment. Finally, a basis is provided for intelligent planning of rehabilitative procedures.

Despite the fact that knowing the cause of a loss of hearing does not insure its amenability to treatment nor necessarily alter the course of training, still it is important to determine the cause if possible. In addition to the doctors', teachers' and parents' interests in the matter, children themselves are likely to inquire about it. Certainly the possibility of hereditary factors is of interest to the entire family and to society in general. It seems a serious

injustice to permit a deaf individual to reach adulthood and parenthood with naive or completely erroneous impressions as to the nature of his handicap.

Of greater importance from an educational standpoint than the cause of deafness and frequently imperative in the determination of the cause are the matters of degree and type of loss of hearing and the age of the child at the onset of the impairment. Either in the absence of suitable medical treatment or at the conclusion of treatment which does not produce complete cure, the suitability of a hearing aid and the availability of proper training facilities become matters of prime importance. The evaluation of both of these approaches to the problem depends to a large extent on the degree and type of deafness and on the age at which the child loses his hearing. If a child has enough residual hearing to acquire speech and language through the auditory channel either with or without the use of amplification, the educational problem is vastly simpler than if speech and language must be developed primarily through senses other than hearing. If the loss of hearing occurs after a child has developed a fairly sound basis of oral communication, the handicapping effect is less severe than if it occurs before oral communication is established. On the other hand, it is likely that a child who has never heard or who loses his hearing early in life undergoes decidedly less emotional disturbance than one who has learned the importance of oral communication before his hearing suffers. Of course there are all degrees of the developmental stages here implied and loss of hearing may occur at any stage of the process. This fact complicates an analysis of the problem, but in no way diminishes the significance of these variable factors in understanding what impairment of hearing means to an individual and to those with whom he associates.

An accurate and authoritative evaluation of the hearing of a child suspected of having hearing disability is an important first step in bringing the parents to grips with the problem. It is the only hope available for ending the frequently futile search for a diagnosis of normalcy and

preoccupation with unrealistic hopes for curative treatment.

Contrary to some belief it surely is an ultimate kindness to parents to be told as early and as accurately as possible the condition of their child's hearing. Certainly it is the only approach that does justice to the child. Acceptance of the situation must be followed by understanding of the problem and of the procedures to be employed in alleviating or compensating for the condition. The discovery or the confirmation that their child has a hearing impairment frequently causes an emotional reaction on the part of parents which must be resolved to some extent before intelligent understanding and management are possible.

Serious responsibility falls on the physician in interpreting the problems of deafness realistically and at the same time hopefully. Feeling of bewilderment and despair must be and can be combated by assurance that loss of hearing need not interfere with adequate growth and development of a child nor with happiness and usefulness as an adult. Realization of this fundamental point can be established more effectively if parents either have visited or can arrange to visit homes and schools where children with similar handicaps are living and learning. If the child in question has total or severe loss of hearing, discussion with a teacher or counselor of the deaf or with an adult deaf person may be of great help. It is helpful also for parents of handicapped children to meet with one another. The sharing of a difficult task may not only make it bearable but frequently facilitates its accomplishment.

By whatever means available it is essential that parents of acoustically handicapped children come to face the matter calmly. Only by doing so can they learn to behave in a manner which will provide the security necessary for the wholesome development of every child. If parents show either by attitude or deed that they are not happy with their child, the child inevitably will sense that discontent and it will instill in him a feeling of inadequacy. On the other hand, if parents wholeheartedly accept the child as he is and look on the handicap as a challenging obstacle,

the child will share that attitude and will be ready to help in overcoming the obstacle.

As individuals and as groups, parents must take the responsibility of educating their neighbors and friends in matters that will facilitate communication with their acoustically handicapped children. There is need for intensive effort along this line to help make the hearing world a pleasanter place for those with impaired hearing. A striking example of this need is seen in the lack of effort on the part of most hearing people to communicate orally with a deaf person. A great many individuals become known as "deafmutes" and behave as if they could not talk while in fact they may have spent many years learning speech and have been considered able to talk satisfactorily by the standards of their teachers. The failure of a hearing person to understand readily a deaf person's speech usually causes both to give up without sincere effort. After a number of such failures the deaf person is likely to become discouraged and quit trying to talk. In turn the hearing person is likely to conclude promptly that the speech of all deaf people is unintelligible. This vicious circle of failure needs to be broken. Probably no one can do more in this respect than wise parents who thoroughly understand the problems imposed by loss of hearing on a child and at the same time can recall the indifference of people not closely associated with this handicap. Of course, it is equally important that the acoustically handicapped person be taught to accept responsibility for helping the hearing world to understand and adjust to his differences.

I do not mean here to delve into all the intricacies of the emotional life of children, but a brief review may be helpful. It is generally agreed that the basic emotional needs of handicapped children are the same as those of all children. Josselyn has stated those needs briefly as "(1) to be loved and to love in return," and "(2) to strike out against situations which are unpleasant." The most important job for the parents of a deaf child is to recognize these needs and to find ways of meeting them. Parents who can sincerely love and accept their child without re-

servation are ready and usually able to cope with the handicap itself. Lassman writes: "Studies have revealed that many emotional problems of the deaf adolescent and adult socially, academically and vocationally have their roots in their parents' attitudes toward the handicap."

Many of the methods as well as the principles of handling acoustically handicapped children may be adapted from those applying to children in general. For example the use of well-established, though flexible, routines in matters of rest, play, eating, dressing, washing and toilet activities are basic in efficient management of all children. Adherence to routine activities is probably even more important to the well-being of children with limited communicative skill than to those who converse normally. In the matter of discipline too the same practices apply for the most part regardless of physical differences. The practice of genuine friendliness, patience and tolerance along with fairness, firmness and consistency can generally be expected to result in acceptable behavior from all types of children. The similarity is seen again in the need for activity. All healthy children are especially active before they learn to talk. Since the deaf child is retarded in development of speech, it is to be expected that his period of excessive activity will be prolonged Thus in the handling of a deaf child the approach should be in terms of guiding the activity rather than curbing it. Provision of suitable toys and play facilities and direction in games of action are appropriate means of meeting this need.

In addition to the general principles of management, parents of a deaf child want to know what to do to promote development of speech and language of their child. They should talk to him, sing to him, and play with him even more than they would with a normal child. This talk and play should utilize all of the senses with particular emphasis on vision and touch and any residual hearing he may have. They should interest the child in watching and imitating facial movements and in hearing and feeling the vibration of sound. They should grasp every opportunity to broaden his interests and ex-

periences both with things and with people, particularly with other children. These experiences may be used as stimuli for development of speech and language. The emphasis upon speech, important as it is, should not obscure the fact that there are other forms of expression which play a vital role in early efforts at communication. Abundant use of gestures, pantomime and facial expression will demonstrate to even a very young child that he can express himself and make many of his wants known in an acceptable manner.

The responsibility of parents to their child is essentially the same whether or not the child attends a nursery school. However, enrollment in a suitable nursery school should be helpful in teaching a deaf child to play and work constructively with other children. If there is no special school available to the young deaf child, it may be wise to enter him in a nursery class along with children who have normal hearing. At the preschool level a handicap in communication need not entirely prohibit profitable experiences. If the child in question is physically and emotionally mature enough, probably he will adjust adequately by watching and imitating other children in individual and group activities. If he lacks the necessary maturity for satisfactory group activity, it may be necessary for the mother or a special assistant to attend nursery school with him until he is ready to participate on his own. The success of an early venture in school will depend to a large measure of course on the attitude and ingenuity of the teacher in charge.

If suitable nursery school facilities are not to be found in the community, it generally is advisable for parents to follow the guidance of a correspondence course providing home training material for deaf children. The John Tracy Clinic in Los Angeles makes such a course available to anyone who writes for it. It is advisable also for mothers to attend one of the short-term training programs for parents of preschool deaf children which are offered each year by a number schools for the deaf. In 1950, such courses were offered by twelve public residential schools and by fifteen denominational or private schools.

Information regarding these courses may be found in the January issue of the AMERICAN ANNALS OF THE DEAF or may be obtained by writing to the editor of that journal.

Sometime before a deaf child is ready for entrance to elementary school, the parents should inform themselves on the types of schools or classes available to him. There are two general types of special schools for deaf children. One is a day school which operates on the same basis as the regular public schools. The other type is a residential school where children both live and attend classes. There are private, denominational and public schools of each type. Certain obvious differences exist in the educational approach and scope of the different types of schools. The day school concerns itself mainly with so-called academic matters, leaving the more personal and social areas of guidance to the home, while the residential school accepts a greater responsibility for the all-round development of the child. The difference often is largely relative inasmuch as children attending residential schools may go home on week ends, holidays and of course, during the summer months.

Beyond these organizational distinctions there are differences in philosophies and emphasis of training from school to school. For this reason it is especially desirable for parents to visit the school in which their child is most likely to be enrolled. If circumstances permit a choice of facilities, it probably is wise for parents to investigate each prospective school from the point of view of the particular needs and desires of the individual child and his family.

In making this assessment parents might well be cautioned to keep the welfare of the child in mind more strongly than their own desires. It is perfectly natural and proper for parents to dread the thought of their child being away from home. As a result of this feeling, they are likely to be willing to accept less adequate facilities near home than might be available to them elsewhere. In this connection too there is strong appeal and

certain logic in the concept that deaf children develop more normally by attending school with children who hear normally than by attending a special school with other deaf children. This reasoning can be supported only if the assumption is made that by attending school with hearing children they also are sharing similar experiences of all kinds. It is important that a child play and work on a relatively equal basis with other children in order to develop and maintain a stable emotional life. Since so much of school life, both academic and social, is dependent on oral communication, it becomes almost impossible for a child with severe hearing loss to compete or even to share experiences comparable with associates who hear normally.

This reasoning is not intended to convey the belief that all deaf children should be educated in schools separate from those for other children, but it suggests that reasons for accepting less than the best facilities available should be examined closely. Generally the best facilities for educating deaf children are to be found in special schools of sufficient size to permit suitable grouping on the basis of age, achievement and social maturity. Larger schools are likely to offer more diversified programs and better physical equipment and thus be more adaptable to individual needs.

Information regarding all of the special schools, special classes, and educational clinics and camps for acoustically handicapped children in the United States and Canada is conveniently tabulated yearly in the January issue of the AMERICAN ANNALS OF THE DEAF. This information includes the location, the size and type of school, the number and training of the teachers, the scope and emphasis of the educational program as well as many other details. A similar directory of schools is given in Myklebust's book, "Your Deaf Child; a Guide for Parents." This book also contains much other information and excellent advice for parents of deaf children. There are other sources of information on this subject—too many to review here. Either of the publications just mentioned will serve as an index to much of the printed material as

well as to individuals and organizations which can be of help to parents and advisers of acoustically handicapped children.

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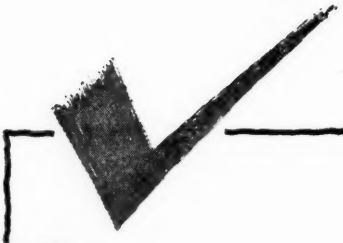

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Visualizing the Units of Measure

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The units of measure are a source of confusion to many of our pupils. Even a simple problem, three yards are how many feet, presented to one of the older pupils, may result in 36 being given as the answer, the solution being found by multiplying 12 by 3. The pupil can be made to see the foolishness of his answer and be guided to the correct one, but the fact that an error in initial reasoning has been made is the important point.

Sometimes, in our preoccupation with end results, we fail to consider by what tortuous mental gymnastics the pupil has arrived at what he considers to be the correct solution to the problem facing him. If his experience with the type of problem or the elements composing it has been inadequate, hazy, or lacking in reality, then his approach to the problem will be on a hit-or-miss basis. He has failed to develop the necessary insight; but instead of criticizing him, we should criticize ourselves for failing to provide him with the basic concepts and experiences upon which insight depends.

When a pupil says that three yards are equal to 36 feet, it very clearly indicates that something vital was neglected in his previous encounters with yards and feet, and with inches, pounds, quarts, and all the rest of the common units of measure. That vital something, we think, is the establishment of sharp, exact mental images of the various measures, plus an understanding of how measures of the same family group are related to each other. This end can be accomplished by taking the measures out of the textbook and allowing pupils to handle them as living facts instead of as mere words. In short, our teaching must be made more functional and less bookish.

This paper will indicate a number of teaching methods and techniques and some desirable learning experiences designed to help pupils acquire correct basic concepts of the units of measure and facility in working with them.

An adequate library of materials is essential to the best teaching of measurement. These can be gathered from various sources, made by the shop classes, the teacher, or the pupils themselves.

Among the essential materials required for teaching measures of length are rules showing inch and half-inch some with one-eighth divisions and some with one-sixteenth divisions, a yard stick, a meter stick, a fifty-foot measuring tape, and rulers with centimeter and millimeter markings. A good way to help pupils visualize inches, feet, yards, and rods is to hang up at the front of the classroom pieces of clothesline cut into these lengths and brightly painted and labeled.

For liquid measures it is necessary to have containers with capacities of cup, pint, quart, and gallon. Dry measures should be available in teaspoon, tablespoon, cup, pint, quart, peck and bushel.

A cardboard clockface with movable hands and a stop watch are indispensable for an understanding of measures of time.

Measures of weight are visualized by providing a series of pounds and ounces of various materials: lead, aluminum, and wood, and cellophane bags of feathers, sugar, salt, flour and meal. Sixteen individual ounce weights of lead are easily made and are a useful teaching device in many ways. Every classroom should also have scales, both the ordinary household variety and inexpensive laboratory pan balances.

In teaching square measures, a square foot, cut from cardboard and marked off into square inches, can be placed at the front of the room as a handy reference device. Fractional parts of a square foot, halves, thirds, fourths and eighths, should be shown on separate pieces also marked off into square inches. Each child should be furnished with an envelope containing 144 square inches cut from paper or cardboard. Four old rulers, each a foot in length, form a sturdy square when bolted at the corners. A square yard can be constructed in the same manner, using yardsticks.

A box of inch cubes, 1728 of them, are useful for study-

ing a cubic foot and its fractional parts. A cubic foot and a cubic yard can also be made, with rulers or wood lath as the edges.

We are sometimes guilty of criticizing students for their failure to apply mathematical principles to the solution of practical problems. For example, a student may have been taught that nine square feet are equal to one square yard, but he is unable to tell how many square yards of linoleum are necessary to cover a floor nine by tweleve feet. The principle is of little value if methods of utilizing it have not been taught, and so the fault would appear to rest with us, as teachers, and not with the student.

The application of any principle depends upon an accurate understanding of that principle. A concept can be made understandable if the student can relate it to his previous experiences. Our error lies in taking too much for granted, in assuming that the student can visualize a situation which is very simple to our minds but may be difficult for him. Drawing a cube in two dimensions on the blackboard is no guarantee that the pupil can visualize the three dimensions of the cube in space. The postage on first class mail is three cents an ounce, but what is the pupil's mental concept of an ounce?

The situation clearly calls for a less abstract and a more objective approach in our teaching. In building up an understanding of units of measure, all concepts should be presented in the most realistic and life-like manner possible under the circumstances. A basic understanding of the meaning and the uses of various units of measure is too important to be glossed over hurriedly in the hope that children will eventually gain insight as the work progresses. Concrete materials and problem situations should be extensively employed, not only at the beginning of a unit of work, but continuously throughout.

Practice in estimating length of lines, distances, and objects is an excellent means of developing a mental awareness of the various measures of length. Such practice has been too frequently neglected or inadequately covered to realize its potential value. The classroom abounds in measurement material: the dimensions of the room, desks,

doors, windows, tables, books and pieces of paper to name a few. Estimating the length of an object or a distance can be an enjoyable and profitable group activity if it is followed up by actual measurement and comparison of answers to determine which pupil has the smallest margin of error. Transferred to the outdoors, the activity can involve the determination of, say, the length of a building; first, by estimating; second, by pacing (the length of the stride must be known); and third, by accurate measurement. Devoting one or two periods to projects of this type is insufficient; practice should be continued until the pupil has proved that he has acquired an accurate concept of an inch, a foot, and a yard, and a clear understanding of their inter-relation.

A mile can be measured easily by taking pupils for an automobile ride and having them note the revolutions of the odometer.

Estimating is also a useful technique for building up the concept of an ounce and a pound. Initially, of course, there must be ample opportunity provided for handling known weights of a variety of materials. Estimating the weights of objects should be followed by actually weighing them, recording the results, and comparing answers. The concept of a ton is somewhat inconvenient for classroom purposes. Almost every school, however, has small platform scales, and on these can be weighed bales of hay, sacks of flour, cement, etc. The class can also visit places where platform scales are used to weigh heavy loads.

The measures of capacity, pints, quarts, etc., both liquid and dry are readily perceived by filling and emptying standard measuring containers. But since capacity does not depend upon either the shape or the external dimensions of the container, it is important to experiment with containers of various shapes and sizes in order to bring out the fact that appearances are often deceiving. This point was brought to our attention one day when a pupil expressed a preference for a bottle of coke rather than a somewhat smaller bottle of another brand of pop. When he was informed that both bottles contained an equal amount of pop, he expressed disbelief, whereupon we proved our

point by filling and refilling both bottles with water. The boy was sadly disillusioned, but we felt we had added something to his stock of knowledge.

Since dry pints, quarts, and pecks have very little social significance in this modern age of packaged goods, these measures should not be over-emphasized in the classroom. The bushel, however, remains in current use as a measure of farm produce and its concept should not be neglected.

The comprehension of measures of time, with the exception of the second, appears to come as a matter of course through daily routines with clock and calendar. Since most schoolroom clocks do not show seconds visually, some experience with this time concept should be provided through the use of stop watches and watches with sweep second hands. With these instruments it is possible to practice the counting of seconds and to gauge the accuracy of such practice.

Problem solving, involving square and cubic measure, represents an area of uncommon difficulty for our pupils. Therefore, much time and attention should be devoted to the fundamental meaning and concept of the square and the cube. It is our experience that drawings and pictures are unrealistic for visual concept in introducing these two forms. Handling models of square and cubic inches, feet, and yards, and actual measurement of surfaces and solids are procedures that are absolutely essential for establishing lasting mental images of the square and the cube.

Our major sin in regard to the teaching of measurement is a too heavy reliance on the textbook as a source of material. While the textbook is a valuable teaching aid, it should be regarded merely as an adjunct and not as the sole component of the teaching process. It is no substitute for actually working with and manipulating the facts with which it deals. Especially in regard to the teaching of basic concepts of units of measure do we need to abandon the textbook in favor of projects and activities which involve as many first-hand experiences as our ingenuity can devise. To tell children, or point out the fact in the textbook, that 16 ounces make a pound is sheer verbalism; to allow children to make up their own ounce weights, to see,

handle, and weigh objects, is more in line with the principle of transfer of training. That transfer takes place through the purposeful activity of the learner. If children are asked to recount a previous learning experience, they will almost invariably recall problems incorporated in projects and activities, rather than problems assigned from the textbook. It is easy for the teacher to dole out work from the textbook; providing concrete learning experiences, however, requires ingenuity and imagination and the expenditure of much time and energy on the teacher's part. The quality of children's work and their depth of understanding and insight into number relationship is more important, we think, than the quantitative coverage of a text.

A Device to Aid Pupils in Changing the Unit in Denominate Numbers

The device which is explained in this section grew out of a need in the writer's own classroom for an orderly system of changing one unit to another; for example, changing minutes to hours, yards to feet, ounces to pounds, etc.

An analysis of errors in this type of problem solving brought out the fact that most pupils experience difficulty in deciding whether to multiply or divide. Sometimes the error is caused by using the wrong unit of measure. Our aim in developing this device was to show pupils not only what process they were to use but the unit number they should multiply or divide by.

The form to be employed and some illustrative examples are given below:

	PROBLEM	UNIT OF MEASURE	LARGER - DIVIDE SMALLER - MULTIPLY
Ex. 1	12 ft. = 4 yds. $3\overline{)12}$ 4	3 ft. = 1 yd.	Yards are larger than feet. Divide by 3.
Ex. 2	½ lb. = 8 oz. ½ x 16 = 8	16 oz. = 1 lb.	Ounces are smaller than pounds. Multiply by 16.
Ex. 3	40 min. = ⅔ hr. $\frac{40}{60} = \frac{2}{3}$	60 min. = 1 hr.	Hours are larger than minutes. Divide by 60.

The column headings are printed on cardboard and thumbtacked at the top of the blackboard at the front of the room. Pupils make their own forms by ruling a sheet of paper in thirds.

The heading of the third column is merely a condensed version of the principle that if the unkown unit is larger than the known, division is the process to be employed; if smaller, multiplication.

The pupil is instructed to write the problem in the first column. See example 1: 12 ft. = —yds. The unit of measure involving feet and yards (3 ft. = 1yd.) is placed in the second column. The pupil is now told to refer to his problem in the first column and determine if the unknown unit (yards) are larger or smaller than the known unit (feet). Since yards are larger than feet, the pupil so indicates in column three. The heading of column three tells him that he is to divide and the unit of measure tells him what number he is to divide by. This information is also written in column three. Actual computation is then carried out under the problem in column one.

Example 2 is an illustration of changing a larger unit to a smaller one, with multiplication as the process.

Example 3 is an illustration of a fractional answer. In problems of this type pupils are prone to use the smaller quantity as the divisor. Dividing 60 by 40 gives 1½ hours as the answer, which is, of course, incorrect for the problem given. It should be stressed to pupils that the unit of measure is **always** the divisor, whether or not it is the smaller or larger quantity.

The column headings are kept at the top of the blackboard permanently to serve as a constant reminder of the process. Pupils can then refer to it at any time.

The use of this form has enabled many pupils to overcome disabilities in operations with denominate numbers. It has helped to organize their thinking by putting down in logical order all the facts which are necessary for the solution of the problem. It has been found that after a period of drill, using this form, many pupils are able to telescope the whole process and mentally carry out the problem to its correct solution. This is, of course, the desired end.

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1953

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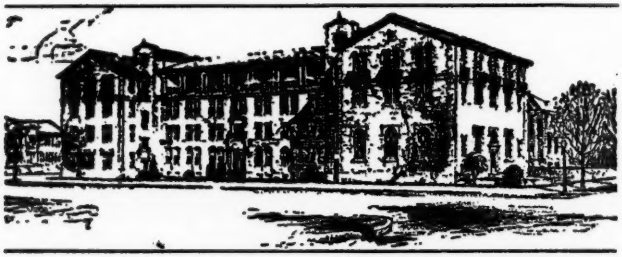
DANIEL T. CLOUD, *President*
Convention of American Instructors of the Deaf.



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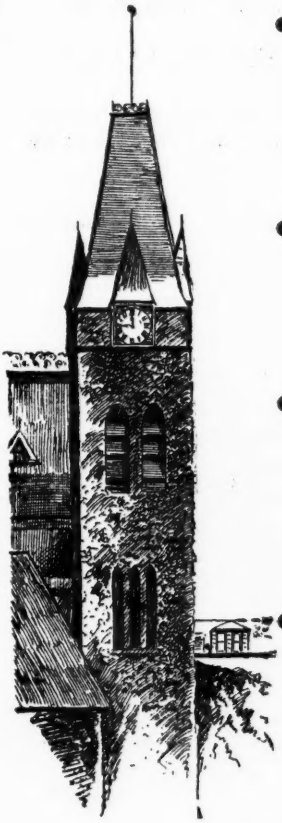

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In April, 1861, the publication ceased because of the War Between the States, inasmuch as the membership of the Convention was made up of northerners and southerners in almost equal proportion. In September, 1868, the AMERICAN ANNALS OF THE DEAF resumed publication with the editorial offices on Kendall Green, in Washington, D. C., where it has since remained.

The AMERICAN ANNALS OF THE DEAF is the official organ of the Conference of Executives of American Schools for the Deaf, which was organized in 1868, and of the Convention of American Instructors of the Deaf, founded in 1850. According to the Library of Congress it is the oldest educational publication in the United States still in existence. It is also the oldest journal on the education of the deaf in the world.

The ANNALS is published five times a year, being issued in September, November, January, March and May. The subscription price is $3.00 a year, payable in advance. If five or more copies of the ANNALS are sent to one address, the subscription price is $2.00 a year. Single numbers sell for seventy-five cents, except for the January number which sells for $2.00. Back issues are available for 1847, 1848, 1849, 1857, and from September, 1868, to the present. Indexes for 1847-1875, 1876-1885, 1886-1895, 1896-1905 are available at $2.00 each. Indexes for 1906-1915, 1916-1925, 1926-1935, 1935-1945 were issued as regular numbers of the ANNALS. All back issues prior to 1930 sell for $1.00 each. All requests for subscriptions or for back numbers should be addressed to the Editor, AMERICAN ANNALS OF THE DEAF, Gallaudet College, Washington 2, D. C.

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Founded 1850

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